

EXHIBIT 7

Declaration of Steven R. Schmid

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

TRAXXAS, L.P.,

Plaintiff,

v.

HOBBICO, INC., *et al.*,

Defendants.

CASE NO. 2:16-cv-00768-JRG-RSP

Lead Case

JURY TRIAL DEMANDED

**DECLARATION OF STEVEN R. SCHMID
IN SUPPORT OF DEFENDANTS' PROPOSED CLAIM CONSTRUCTIONS**

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I. INTRODUCTION

1. I have been retained as an expert in this case on behalf of defendants Hobbico, Inc. and Arrma Durango, Ltd., and The Firelands Group, LLC, for the purpose of providing expert opinions and testimony regarding the technology involved in this case and what a person of ordinary skill in the art (“POSITA”), at the relevant time, would understand some of the technical terms in the claims to mean. Unless otherwise noted, the statements made herein are based on my personal knowledge and experience, and if called to testify in Court, I could and would testify competently and truthfully with regard to the contents of this declaration.

2. I am being compensated at my usual consulting rate of \$400 per hour for my work on this matter. My compensation is in no way dependent on the outcome of this matter or the testimony or opinions that I give.

3. I reserve the right to supplement this declaration if further information becomes available or if I am asked to consider additional information. I further reserve the right to consider and comment on any expert opinions, statements, or testimony offered by the plaintiff in this matter.

4. A copy of my *Curriculum Vitae* is attached hereto as Exhibit A.

A. Education and Experience

5. I am a licensed professional engineer in the State of Illinois, with a Ph.D. in Mechanical Engineering. I graduated from the Illinois Institute of Technology in 1986 with a Bachelor of Science degree in Mechanical Engineering with Honors. I received a Master of Science degree in Mechanical Engineering from Northwestern University in 1989, and a Ph.D. in Mechanical Engineering from Northwestern University in 1993. I am a Fellow of the American Society of Mechanical Engineers and a Fellow of the American Society of Manufacturing

Engineers. I served as President of the North American Manufacturing Institute from 2015-2016, am co-chair of the ASME Manufacturing Public Policy Task Team, a Member of the SME Manufacturing Policy Committee, and a Member of the SME Board of Trustees.

6. I have taught engineering design at the University of Notre Dame for over 20 years and continue to teach engineering design at Notre Dame. I have written many textbooks and peer-reviewed journal papers in the area of mechanical engineering design. Among these books are *Fundamentals of Machine Elements*, CRC Press (3rd ed. 2014), *Manufacturing Processes for Engineering Materials*, Pearson (6th ed. 2016); and *Manufacturing Engineering and Technology*, Pearson (7th ed. 2014). These books have been translated into numerous languages, including Spanish, Italian, German, Mandarin (Chinese), Korean, Japanese, Macedonian and Arabic.

7. I teach a popular metal forming course for the Society of Automotive Engineers (SAE). I have taught this course at locations around the world, including Delphi facilities in Cali, Columbia; Ford in Mexico City, Mexico; Daimler in Portland, Oregon; Honda in Normal, Illinois; and at SAE meetings.

8. I served as Associate Director for Research Partnerships at the Advanced Manufacturing National Program Office at the U.S. Department of Commerce in 2012-2013, where I was part of the team that designed the National Network for Manufacturing Innovation program. I am currently the Program Director for Manufacturing Machines and Equipment at the National Science Foundation, where I oversee the U.S. investment portfolio in manufacturing research. I have been given awards for my research and papers from the American Society of Mechanical Engineers and Society of Manufacturing Engineers.

9. My textbook, *Manufacturing Engineering and Technology*, is the world's most widely used manufacturing textbook. It is currently in use at schools such as the Massachusetts Institute of Technology (MIT), the University of Michigan, the University of California at Berkeley, Georgia Institute of Technology, Purdue University, the University of Illinois, Northwestern University, and many others.

10. I do research and write books on manufacturing and machine design, and these areas are thoroughly addressed in my books. My textbook (*Manufacturing Engineering and Technology*) and the classes that I teach prepare students to become persons of ordinary skill in a wide array of mechanical arts. My undergraduate and graduate students go on to careers in a wide variety of industries, including, for example, aerospace (Boeing, Pratt & Whitney, GE, Rolls Royce), automotive (Ford, GM, Chrysler, Honda, Toyota, BMW), medical (Johnson and Johnson, Zimmer, Biomet, Abbot, Baxter, Smith & Nephew, Medtronic), materials (ALCOA, Arcelor Mittal, Applied Materials), and many others.

B. Materials Reviewed

11. In connection with this declaration, I have read U.S. Patent Nos. 7,793,951 B2 ("the '951 patent"); 8,315,040 B2 ("the '040 patent"); 8,982,541 B1 ("the '541 patent"); 7,883,099 B2 ("the '099 patent"); 9,061,763 B1 ("the '763 patent"); and 9,221,539 B2 ("the '539 patent") (collectively, the "asserted patents" or "patents-in-suit").

12. In reaching the opinions and conclusions set forth in this declaration, I have relied upon my education, experience and training, my review of the patents-in-suit, the prosecution histories, the prior claim construction ruling in *Traxxas LP v. Hobby Products International, Inc. d/b/a HPI Racing, et al.*, 2:15-cv-1267, the preliminary proposed claim constructions from

defendants and plaintiff, and my review of the evidence cited by the parties in support of their proposed constructions.

13. My opinions regarding claim construction are based on my understanding of the parties' proposed constructions as of the date of this declaration. If the parties modify their proposed constructions after this declaration is completed, I may submit a supplemental declaration addressing any new constructions.

C. Level of Ordinary Skill in the Art

14. Based upon a review of the asserted patents, the claimed inventions relate generally to aspects of mechanical design. It is my opinion that, as of the date of the various applications and patents, a person of ordinary skill in the art of the asserted patents would have had at least a bachelor's degree in mechanical engineering, or related field of study, and at least two years of professional experience with mechanical design.

D. Scope of Opinions

15. I have been asked to provide my opinions regarding the meaning of certain disputed claim terms as understood by one of ordinary skill in the art at the time of the invention. My opinions are based on my understanding of the disputed claim terms and the parties' proposed constructions, and the evidence relied upon by the parties, as of the time I executed this declaration.

E. Legal Standards

1. Claim Construction

16. I have been informed and understand that claim construction is a matter of law to be decided exclusively by the Court. I have also been informed and understand that claim construction analysis begins with the ordinary and customary meaning of a claim term and that a

term is presumed to have the plain meaning with which a person of ordinary skill in the art in question would understand the term at the time of the invention.

17. I have been informed and understand that the “intrinsic evidence,” which includes the claims, the specification, and the prosecution history, is the most important tool for determining the meaning of a claim term. I have also been informed that extrinsic evidence (e.g., technical dictionaries and treatises) may also provide guidance about a claim term, but it is generally less significant than the intrinsic record in determining the legally operative meaning of the claim language.

18. I have been informed that an inventor may act as his own lexicographer and define a term in either the specification or file history that is different from the term’s ordinary and customary meaning, and that the meaning of a claim term can also be modified if an inventor clearly and unequivocally disavows the broader meaning of the term in either the specification or the prosecution history.

2. Prosecution History

19. I have been informed and understand that under the doctrine of prosecution history disavowal, the prosecution history of a patent can limit the interpretation of a claim to exclude any interpretation that the patentee disclaimed or disavowed during prosecution.

20. I understand that such disavowal may arise if the applicant distinguishes prior art during prosecution by asserting that the prior art omits elements that the applicant asserts are required by the patent’s claims.

21. I understand that any such disavowal must be clear and unmistakable.

22. I have been informed and understand that when a patent is part of a family of patents stemming from a common disclosure, the prosecution history includes the prosecution histories of other patents and patent applications sharing this common disclosure.

3. Claim Indefiniteness

23. It is my understanding that a patent's specification should conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

24. I have been informed and understand that a claim is indefinite if it fails to set forth what the applicant regards as the invention with sufficient particularity and distinctness. In other words, a claim is indefinite if, when read in light of the patent's specification and prosecution history, it fails to inform those skilled in the art about the scope of the invention with reasonable certainty.

25. I have also been informed and understand that when a term of degree is used in a claim, the patent's specification must provide some standard for measuring that degree. Similarly, when a subjective term is used in a claim, the patent's specification must provide some standard for measuring the scope of the term or the limitation in which the term is found.

II. OVERVIEW OF THE PATENTS-IN-SUIT

A. The '040 and '541 Patents

26. The common specifications of the '040 and '541 patents disclose a housing or enclosure intended for use in model vehicles. The intent is to allow for a volume that is protected from water and other contaminants to protect the elements inside the volume, namely electrical connections and relatively fragile electronics. The protective enclosure includes a means for electrical conductors (wires) to pass through the housing without compromising the

hermetic nature of the housing. This is done by using a compliant material at a location slightly offset from the point where the wires pass through the housing; the compliant material essentially provides the mating surface of a clamp, which conforms to the wires and forms a seal to ensure no contaminants or water can pass through them.

B. The '763 and '539 Patents

27. The common specifications of the '763 and '539 patents relate to the design of flying craft (rotorcraft) or drone aircraft. The '763 patent relates generally to a lighting arrangement that includes longitudinal illuminating arm portions. The '539 patent relates generally to mounting a circuit board within a drone that includes light source(s) oriented away from and aligned with the plane of an integrated circuit board. The light source(s) is/are used as a mounting mechanism for the circuit board in order to suspend the board away from its housing.

C. The '951 and '099 Patents

28. The common specifications of the '951 and '099 patents relate to improving the handling characteristics of toy/model vehicles. The claimed subject matter of the '951 patent concerns a steering mechanism for a toy model vehicle while the claimed subject matter of the '099 patent concerns toy model vehicle suspension.

III. DISPUTED CLAIM TERMS

A. chassis ('951 Patent, claims 27, 43)

29. I have been asked to provide my opinion as to how a person of ordinary skill in the art (POSITA) would understand the term “chassis” as used in the '951 patent, and in particular asserted claims 27 and 43 of the '951 patent. As explained below, it is my opinion that, in the context of asserted claims 27 and 43 of the '951 patent, a POSITA would understand the term “chassis” to mean “a horizontally extending base frame of the vehicle that defines a

longitudinal centerline for the vehicle and which provides a vertical reference for the spatial relationship between the transmission drive shaft and the steering control arm.”

30. The term “chassis” arises from the practice and art of vehicle design, where the chassis is the structural or base-frame of the vehicle. *See* Nayler, *Dictionary of Mechanical Engineering*, Society of Automotive Engineers (4th ed. 1996). The chassis is almost exclusively formed by constructing a horizontally-extending rigid support at the bottom of the vehicle, either with a frame construction, a roll-formed plate underbody, or a combination. The operator compartment is located on top of this chassis, along with controls (e.g., brakes, transmission settings, steering, etc.) in traditional automobiles, such that the chassis supports these components in a vertical direction.

31. There are functional reasons for the above arrangement in normal vehicles intended for in-vehicle human operation or human transportation, or for conventional road travel. Placing the operator on top of the chassis provides a rigid support for seating, allowing safe and secure operation; the operator is not jerked away from controls due to external forces applied to the vehicle. Orienting the chassis horizontally and low makes the vehicle more stable.

32. The horizontal underbody arrangement follows from engineering principles so clearly that this is the natural design of all types of vehicles. Indeed, this arrangement is routinely assumed when discussing a chassis. An underbody, with or without a supporting frame, is the base frame of the vehicle – it is the chassis.

33. As used in claims 27 and 43 of the ’951 patent, the term “chassis” is consistent with its conventional usage as described above, but in addition the term is expressed in a manner which is interrelated with other elements of those claims. Thus, the usage of the term “chassis” in the context of claims 27 and 43 of the ’951 patent imparts additional requirements for the

term. In order to understand the context, below I set forth claim 27 and have highlighted several portions of the claim that include the term “chassis”:

27. A steering mechanism for a toy model vehicle, comprising:
a vehicle chassis;
a plurality of suspension arms, each supported on opposite sides of the chassis for substantially vertical pivotal movement relative to the chassis;
a plurality of wheels, wherein each of the wheels is supported by one of the suspension arms for steering the toy model vehicle;
a steering control arm pivotally supported on the chassis substantially on a chassis longitudinal centerline for substantially horizontal pivotal movement about an arm pivot axis relative to the chassis;
a plurality of tie rods coupled to the steering control arm for steering the plurality of wheels and extending in substantially opposite directions, each tie rod supported by the steering control arm for substantially vertical pivotal movement relative to the chassis and for inboard and outboard actuation by the steering control arm to steer the plurality of wheels; and
wherein the outboard end of the suspension arms each has a range of travel of at least about 1 cm. of vertical displacement; and
a transmission drive shaft rotatably coupled to at least one wheel for driving the at least one wheel of the toy model vehicle, the transmission drive shaft positioned above the steering control arm, relative to the chassis.

34. In claim 27 of the '951 patent, the term “chassis” appears eight times – first when it is introduced as “vehicle chassis” and then seven other instances where the term is used in connection with other elements of the claim which impart various structural requirements for the term “chassis.”

35. The first occurrence of the term chassis introduces the term as a “vehicle chassis.” As explained above, the conventional understanding of this term to a POSITA can be found in a variety of technical references in my field, including, for example, from a dictionary from the Society of Automotive Engineers which defines chassis as “the base-frame of a vehicle.” Nayler, *Dictionary of Mechanical Engineering*, Society of Automotive Engineers (4th ed. 1996).

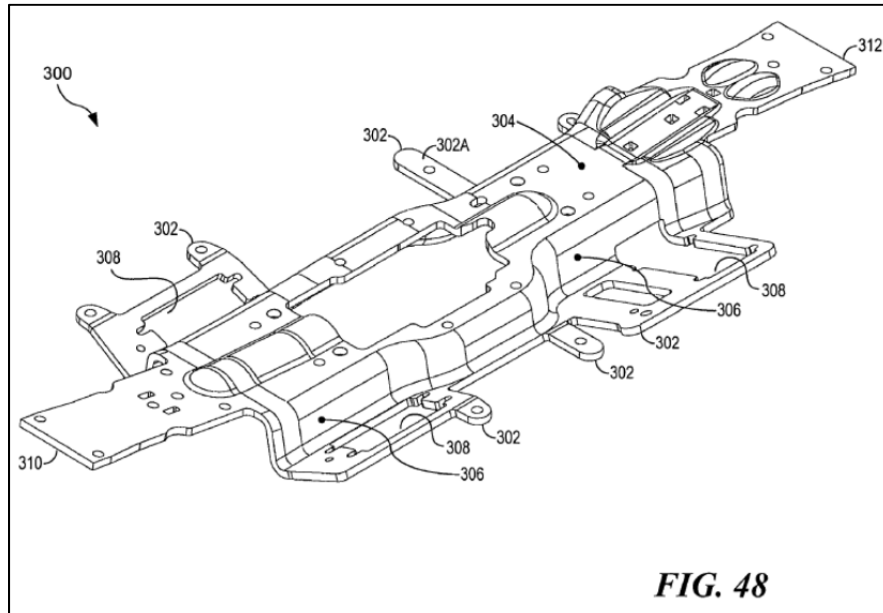
Similarly, an automotive technology handbook explains that “[t]he chassis frame is the commercial vehicle’s actual load-bearing element, it is designed as a ladder-type frame, consisting of side and cross members.” *Bosch Automotive Handbook*, Robert Bosch GmbH (3rd ed. 1993). In addition, Wikipedia describes “[a]n example of a chassis is the underpart of a motor vehicle, consisting of the frame (on which the body is mounted).” Wikipedia (article on “chassis”) (last edited April 10, 2017).

36. The remaining occurrences of the term chassis in claim 27 of the ’951 patent define further parameters and requirements for the term in relation to other elements of the claim. In particular, claim 27 recites “a steering control arm pivotally supported on the chassis substantially on a chassis longitudinal centerline,” which means that the term “chassis” as used in claim 27 must also define a longitudinal centerline for the vehicle. Claim 27 also recites “the transmission drive shaft positioned above the steering control arm, relative to the chassis,” meaning that the “chassis” as used in claim 27 must be a horizontal element that provides a vertical reference for the spatial relationship between the other two elements – the transmission drive shaft and the steering control arm. This is natural and consistent with vehicles – components are mounted on top of the chassis, which conventionally provides support below (i.e., in a vertical direction).

37. Claim 43 of the ’951 patent uses the term “chassis” in the same manner as claim 27. Therefore, my opinion as to how a POSITA would understand the term “chassis” as that term is used in claim 43 is the same as my above opinion regarding a POSITA’s understanding of the term as used in claim 27.

38. The drawings and specification of the ’951 patent illustrate and describe the claimed “chassis” in a manner consistent with my above opinion as to how a POSITA would

understand the term. In particular, Figs. 47A-52 of the '951 patent illustrate the chassis (denoted by reference number 300) as a horizontal base plate. The horizontally-oriented structure of the chassis is clearly shown in Fig. 48, for example.



39. While the chassis 300 disclosed in the '951 patent resembles conventional chasses in the sense of being a horizontally extending base frame of the vehicle, the chassis 300 also includes lateral flanges 302 that extend from a central channel area 304 of the chassis 300. *See* '951 patent, col. 22:22-24. The specification of the '951 patent describes that “[i]n general, the flanges 302 lower the mounting points of various components on the chassis 300, at least relative to the transmission assembly 520 and transmission output shaft 521.” Col. 22:29-32. These lower mounting points result in a lower center of gravity. *See* col. 22:19-22. The flanges 302 also gradually slope upwards as they extend laterally from the central channel area 304, which “causes the components supported on the flanges 302 to extend both upwardly and inwardly toward the center of the vehicle 1400, more tightly packaging the components on the chassis 300.” Col. 22:32-38.

40. I reviewed portions of the file history for the '951 patent when preparing this declaration. I understand that an applicant can limit the scope of a patent's claims through unambiguous statements in the file history of the patent (or its related patents) that narrow a claim through, for example, distinguishing prior art as lacking a particular feature.

41. Through my review of the file history for the '951 patent, I noted repeated instances in which the applicant distinguished prior art on the basis that the prior art did not include a "transmission drive shaft positioned above the steering control arm, *relative to the chassis*," as recited in claims 27 and 43. (Emphasis added).

42. For example, during prosecution of the '951 patent, the applicant asserted:

Applicant contends that the rejection of Claims 27 and 31 are traversed for at least some of the reasons that the rejection of Claim 1 is overcome. These reasons include Watanabe not disclosing, teaching, or suggesting with respect to Claim 27 "a transmission drive shaft *positioned above the first and second pivots*, relative to the chassis," and with respect to Claim 31 "*a transmission drive shaft positioned above the steering control arm*, relative to the chassis, for driving at least one of the plurality of wheels." (Emphasis added.) Applicant therefore respectfully submits that Claims 27 and 31 are clearly and precisely distinguishable over the cited references in any combination.

'951 FH, January 21, 2009 Amendment at 14.

43. The applicant also asserted that "[t]here is no reason or rationale to modify Umstott in view of Watanabe, because Watanabe does not disclose the relative position of a transmission input shaft to the disclosed steering mechanism, but is rather concerned with the coupling between the actuator motors M1 and M2 to the steering shaft 1." *Id.* at 15.

44. The requirement of the transmission drive shaft being positioned above the steering control arm in relation to the chassis along a vertical direction was also relied on by the applicant to distinguish another prior art reference:

Rejected independent Claim 28 as now amended more particularly recites one of the distinguishing characteristics of the present invention, namely, ‘a transmission drive shaft rotatably coupled to at least one wheel for driving the at least one wheel of the vehicle, ***the transmission drive shaft positioned above the steering control arm***, relative to the chassis, for driving at least one of the plurality of wheels.’ (Emphasis added.).

’951 FH, July 29, 2009 Amendment at 16.

45. In further distinguishing the prior art reference, the applicant argues “[i]n addition, the figures of Lahr show the steering mechanism schematically and do not show the relative vertical positions of the chassis 11 and the steering arms 10.” ’951 FH, July 29, 2009 Amendment at 24.

46. During prosecution of the ’951 patent, the applicant also distinguished the prior art by amending the claims to specifically recite “a steering control arm ***pivotally supported on the chassis substantially on a chassis longitudinal centerline*** for substantially horizontal pivotal movement relative to the chassis,” (emphasis added) and arguing that the prior art lacked this requirement of the steering control arm being centrally mounted on a longitudinal centerline of the chassis. ’951 FH, January 21, 2009 Amendment at 11 (“Rejected independent Claim 28 as now amended recites one of the distinguishing characteristics of the present invention, namely, ‘a steering control arm ***pivotally supported on the chassis substantially on a chassis longitudinal centerline*** for substantially horizontal pivotal movement relative to the chassis” and “a plurality of tie rods ***coupled to the steering control arm***.”) (emphasis in original).

47. When distinguishing a prior art reference during prosecution of the ’951 patent, the applicant asserted:

Regarding Claim 28, Umstott was not cited as assertedly fully disclosing a pivoting steering control arm mounted substantially on the chassis centerline. Umstott teaches that pivoting arms 38 and 39 are coupled to separate rods 24. These rods 24 are coupled at housing 15, but housing 15 does not pivot. See Umstott, Col. 1, 65 -71. Umstott provides

for a steering action through the pivoting of arms 38 and 39, which are positioned away from the chassis centerline. Umstott teaches away from the use of a centrally mounted pivotable steering control arm by teaching separately located pivoting arms, which couple to separate steering shafts. There is no reason or rationale to modify Umstott to teach a central steering arm that ties both rods together, because Umstott discloses a dual control steering mechanism, which requires two separate steering shafts that provide two steering inputs. Tying two steering shafts to one steering control arm would only lead to unpredictable results.

'951 FH, January 21, 2009 Amendment at 12.

48. The requirement of the chassis defining a longitudinal centerline upon which the steering control arm is pivotally mounted was further emphasized to distinguish over the prior art reference when applicant argued:

Applicant contends that the rejection of amended Claim 1 is overcome for at least some of the reasons that the rejection of Claim 22 is traversed. These reasons include Umstott not teaching, disclosing, or suggesting “a steering control arm *pivotally mounted to the chassis substantially on a chassis longitudinal centerline*.” (Emphasis Added). Umstott instead teaches away from the use of a centrally mounted pivoting steering control arm by teaching two separate pivoting arms disposed at opposing ends of rods 24. Each pivoting arm 38, 39 is positioned to receive a different steering input from a different steering shaft. There is no reason or rationale to combine the pivoting arms into one centrally located structure substantially on the chassis longitudinal centerline when the disclosure of Umstott teaches a dual steering mechanism.

'951 FH, January 21, 2009 Amendment at 14.

49. Claim 43 of the '951 patent was added during prosecution as claim 47. *See* '951 FH, March 26, 2010 Amendment at 10, 20-21. Claim 47 was added as a new claim, and recited, *inter alia*, “a steering control arm pivotally mounted to a toy model vehicle chassis substantially on a chassis longitudinal centerline for rotation relative to the toy model vehicle chassis” and “a transmission drive shaft rotatably coupled to at least one wheel for driving the at least one wheel of the toy model vehicle, the transmission drive shaft positioned above the steering control arm, relative to the chassis.”

50. It is noteworthy that claim 47 was added after the applicant, in the previous two responses, had distinguished the prior art on the basis that the prior art did not include the requirements of the transmission drive shaft positioned above the steering control arm in relation to the chassis, or the chassis defining a longitudinal centerline upon which the steering control arm is pivotally mounted.

51. There are other instances of the applicant distinguishing prior art on these same bases (namely, (i) the requirement of the transmission drive shaft being positioned above the steering control arm in relation to the chassis; and (ii) the requirement of the chassis defining a longitudinal centerline upon which the steering control arm is pivotally mounted) during prosecution of the '951 patent. *See, e.g., '951 FH, January 21, 2009 Amendment at 13* (“Rejected independent Claim 1, as now amended, recites one of the distinguishing characteristics of the present invention, namely, ‘a transmission drive shaft *rotatably coupled to at least one wheel* for driving the at least one wheel of the vehicle, *the transmission drive shaft positioned above the steering control arm, relative to the chassis, and between the couplings of the steering actuators to the steering control arm.*’ (Emphasis added.)”); ‘951 FH, July 29, 2009 Amendment at 3 (amending the claim 11 recitation of “the centerline of the vehicle” to “the *chassis longitudinal* centerline of the toy model vehicle.”) (emphasis added); *id* at 19 (“And the Applicants submit that Chevalier Figure 2 shows that there would have been insufficient space between the steering mechanism and the support bars forming the chassis to fit a transmission drive shaft, even if such a transmission drive shaft were extended from the rear of the ATV disclosed in Chevalier.”).

52. Based upon this evidence, it is my opinion that a POSITA would understand that the '951 patent requires a “chassis” that is horizontally extending, that defines a longitudinal

centerline for the vehicle, and which provides a vertical reference for the spatial relationship between the transmission drive shaft and the steering control arm, and that the construction proposed by the defendants for this term is correct.

B. chassis ('099 Patent, claims 1, 2, 6, 7, 13)

53. I have been asked to provide my opinion as to how a POSITA would understand the term “chassis” as used in the '099 patent, and in particular asserted claims 1, 2, 6, 7, and 13 of the '099 patent. As explained below, it is my opinion that, in the context of asserted claims 1, 2, 6, 7, and 13 of the '099 patent, a POSITA would understand the term “chassis” to mean “a horizontally extending base frame to which the wheel suspension spring and damper are mounted.”

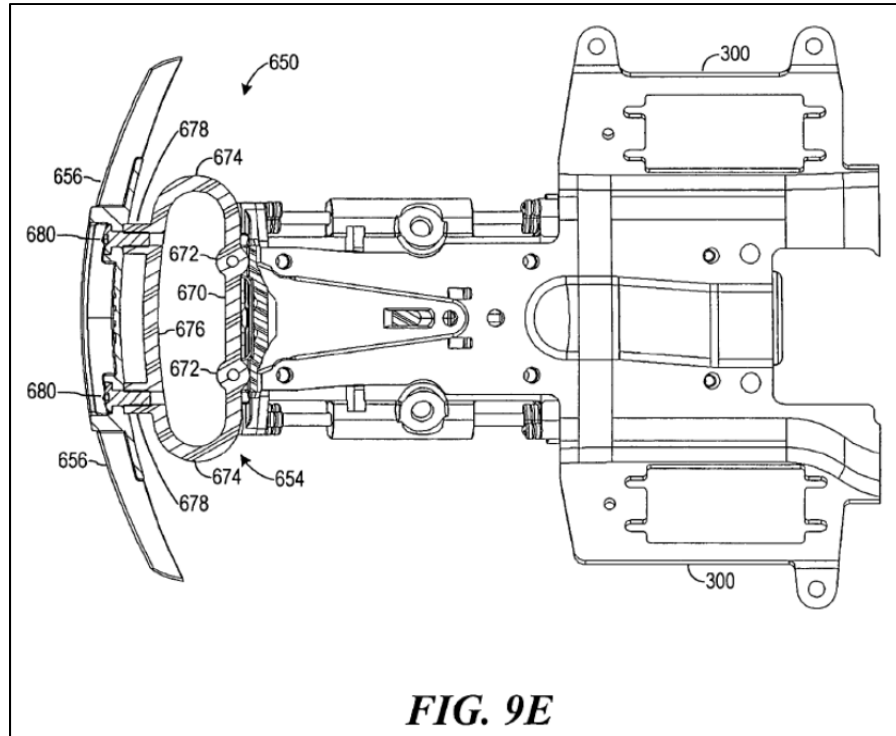
54. As used in the asserted claims of the '099 patent, the term “chassis” is consistent with its conventional usage as described above in Section III.A, but the term is also expressed in connection with other elements of those claims. Thus, the usage of the term “chassis” in the context of the asserted claims of the '099 patent imparts additional requirements for the term. The highlighted portions of claim 1 of the '099 patent set forth below illustrate the additional requirements for the term “chassis”:

1. A toy model vehicle suspension, comprising:
 - a toy model vehicle chassis;
 - a first wheel for supporting at least a portion of the toy model vehicle chassis above an underlying surface;
 - a first spring for providing a supporting suspension force to the first wheel, wherein the first spring is mounted to the toy model vehicle chassis for deflection within a range of first spring travel;
 - a first damper for providing a damping suspension force to the first wheel, the first damper having an elongated shape, wherein the first damper is mounted to the toy model vehicle chassis for actuation within a range of first damper travel that is substantially equal to the range of first spring travel;
 - a first suspension member secured to the toy model vehicle chassis for supporting the first wheel, the first suspension member mounted for a range of first suspension member travel at substantially a location of the first wheel, wherein an average motion ratio of the range of first suspension member travel to the range of first damper travel is at least about 2.5;
 - a first coupling mechanism configured to transmit the supporting suspension force from the first spring to the first wheel through the first suspension member, while allowing movement of the first suspension member substantially at the point of supporting the first wheel; and
- wherein the first wheel comprises a first tire, wherein the first wheel is supported by the first suspension member for movement of the first wheel and the first tire, and wherein the first wheel and the first tire have a range of vertical movement at least about half of a diameter of the first tire.

55. This is consistent with the normal understanding of a chassis, in that a horizontal chassis is held above an underlying surface (i.e., a road or ground) by a spring and damper arrangement and wheels to provide a vertical frame of reference.

56. Claims 2, 6 and 7, which all depend from claim 1, as well as independent claim 13 use the term “chassis” in a similar manner. These claims also use the term “chassis” consistent with the conventional definition and notion – a horizontal plate supported by wheels, axles and suspension, onto which other components are mounted.

57. The drawings and specification of the '099 patent illustrate and describe the claimed "chassis" in a manner consistent with my above opinion as to how a POSITA would understand the term. In particular, Figs. 1, 4A, 9A, 9D, 10, 11, and 47A-52 of the '099 patent illustrate the chassis (denoted by reference number 300) as a generally horizontal base plate. The horizontally-oriented structure of the chassis is clearly shown in Fig. 9E, for example.



58. While the chassis 300 disclosed in the '099 patent resembles conventional chassis in the sense of being a horizontally extending base frame of the vehicle, the chassis 300 also includes lateral flanges 302 that extend from a central channel area 304 of the chassis 300. *See* '099 patent, col. 22:43-45. The specification of the '099 patent describes that "[i]n general, the flanges 302 lower the mounting points of various components on the chassis 300, at least relative to the transmission assembly 520 and transmission output shaft 521." Col. 22:50-53. These lower mounting points result in a lower center of gravity. *See* col. 22:40-43. The flanges 302 also gradually slope upwards as they extend laterally from the central channel area 304, which

“causes the components supported on the flanges 302 to extend both upwardly and inwardly toward the center of the vehicle 1400, more tightly packaging the components on the chassis 300.” Col. 22:53-59.

59. The specification of the '099 patent describes mounting of a number of components onto the chassis. For example, “Fig. 1 illustrates a vehicle engine 500 supported by an engine mount 510 (partially shown) on the vehicle chassis 300” and “[t]he engine mount 510 is configured to allow generally vertical movement, shown by the arrows 522, to accommodate drive and spur gears 516, 518 of different sizes or to allow engagement and disengagement of a vehicle engine with a transmission.” Col. 5:58-66. Fig. 1 of the '099 patent shows what is meant by a vertical direction, making the chassis substantially horizontal. The specification of the '099 patent also discloses that the “[v]ehicle chassis 300 has a fuel tank 852 secured thereon.” Col. 10:7-8.

60. That the term “chassis” in the context of the '099 patent would be understood by one of ordinary skill in the art to mean a horizontally extending base frame to which the wheel suspension spring and damper are mounted, is consistent with the meaning of the term as used in the specification of the '951 patent, which is common with the specification of the '099 patent.

61. The horizontal nature of the chassis is further reinforced by the description of the bumper location in the specification of the '099 patent. In particular, the specification of the '099 patent discloses “[r]eferring additionally to FIG. 9E, the bumper support 654 is formed in a generally oval-shape loop and is mounted to the bulkhead assembly 658 in a horizontal orientation relative to the chassis 300.” Col. 8:55-59.

C. adjacent ('763 Patent, claims 1, 16)

62. I have been asked to provide my opinion as to how a POSITA would understand the term “adjacent” as used in the '763 patent, and in particular asserted claims 1 and 16 of the '763 patent. As explained below, it is my opinion that, in the context of asserted claims 1 and 16 of the '763 patent, a POSITA would understand the term “adjacent” to mean “next to, and not within, and having no intervening structure between.”

63. The term “adjacent” appears in asserted claims 1 and 16 of the '763 patent and is used in those claims in a manner which is interrelated with other elements of those claims. Thus, the context of the term “adjacent” within the asserted claims is important to how a POSITA would understand the meaning of that term as it used in those claims. In order to understand the context, below I set forth claims 1 and 16 and have highlighted portions of the claims that include the term “adjacent”:

1. A radio controlled model rotorcraft, comprising:
a first cover, comprising at least one support frame;
at least one light source disposed adjacent the first cover;
and
a plurality of rotor assemblies, each rotor assembly comprising at least one motor;
at least one rotor assembly further comprising:
an arm having a longitudinal length extending outwardly from the first cover, the arm comprising at least one illuminating arm portion extending longitudinally along at least a portion of the length of the arm and comprising material in the range of at least translucent to fully transparent; and
wherein the at least one motor is mounted on the arm;
wherein the at least one illuminating arm portion receives and transmits light longitudinally along at least a portion of the length of the arm from the at least one light source disposed adjacent the first cover and illuminates in response to the light received and transmitted; and
wherein the arm is configured to allow substantially unobstructed transmission of at least a portion of light emitted by the at least one light source to the at least one illuminating arm portion.

16. The radio controlled model rotorcraft of claim 1, wherein the number of light sources corresponds to at least the number of rotor assemblies, wherein the arm of the at least one rotor assembly is optically paired with, and receives light most intensely from, a single light source from among the at least one light sources disposed adjacent the first cover.

64. As set forth above, the term “adjacent” is used in claims 1 and 16 to describe the location of the light source(s) with respect to the claimed “first cover.” However, in the specification of the ’763 patent, the term “adjacent” does not appear anywhere in the portion describing the disposition of the light sources. Instead, the location of the light sources with respect to the first cover must be inferred from the drawings and other portions of the disclosure.

65. The specification of the ’763 patent states: “Referring to FIGS. 11, 12, and 13A-C, in an embodiment, the base 504 may further comprise a plurality of locator recesses 518A-D for receiving, positioning, and securing locators 519A-D, thereby setting the location and orientation of the light source 511A-D to which the locator 519A-D is affixed.” Col. 16:59-64.

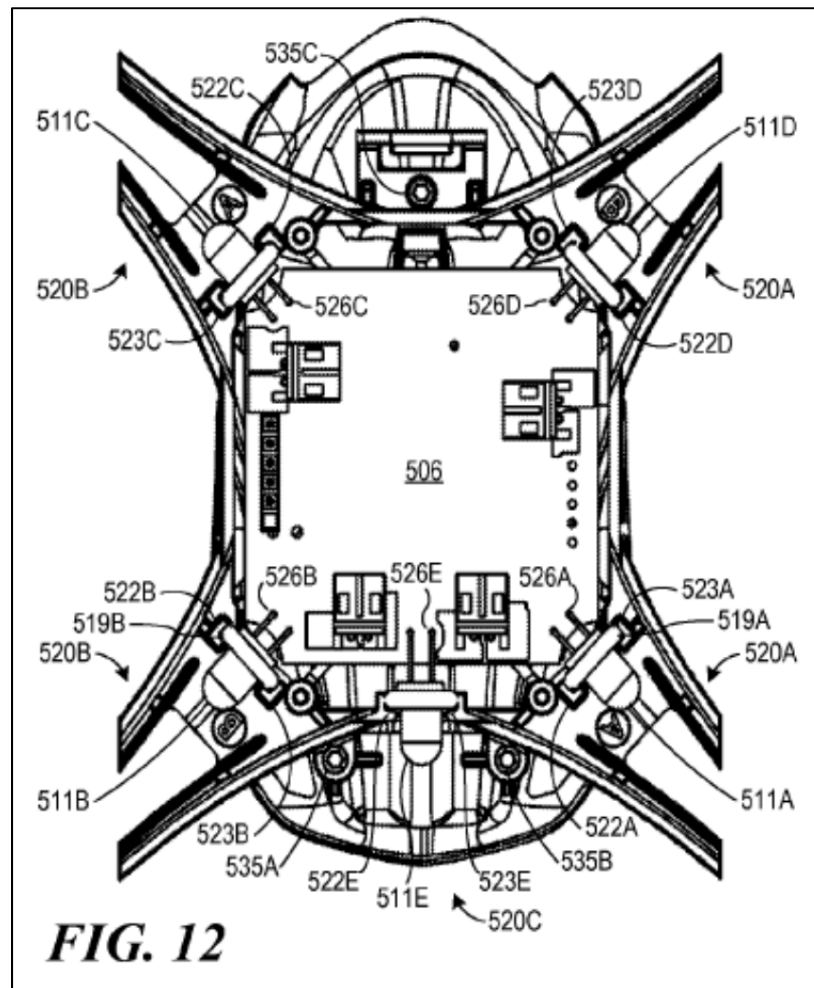
The specification also describes:

As shown in FIGS. 11B, 12, 13B, and 13C, in an embodiment the locator cradles 520A-E may be disposed and oriented within the first cover 502 at locations corresponding to, and aligning with the locations of the locator recesses 518A-E of the base 504, so that the locator cradles 520A-E and the locator recesses 518A-E may simultaneously receive the locators 519A-E when the base 504 and first cover 502 are coupled.

Col. 17:28-35.

66. Fig. 12 of the ’763 patent shows the light sources 511A-D in the locators 519A-D. The locator recesses 518A-D would align with these locations when the base 504 and first cover 502 are joined. In this configuration, the light sources 511A-D extend past the locators 519A-D and the locator recesses 518A-D, much like a push button extends above a surface. When the first cover 502 is coupled to the base 504, the light sources 511A-D are positioned next to the first cover 502, but not within the first cover 502, and there is no structure intervening between

each of the light sources 511A-D and the first cover 502. As such, the light sources 511A-D are adjacent to the first cover 502.



67. The same design approach is used for the tail light 519E. With reference to Figs. 11A, 11B, and 12, the specification of the '763 patent describes “[t]he locator recess 518E [for setting the location and orientation of the tail light, light source 511E] may be located adjacent to side surface 508A and may also be configured to support, position, and secure a light source 511E, so that the light source 519E may partially pass through the light opening 512E.” Col. 17:7-11.

68. In my opinion, in the context of asserted claims 1 and 16 of the '763 patent, a POSITA would understand the term “adjacent” to mean “next to, and not within, and having no

intervening structure between.” This definition is consistent with the common understanding of the term. *See Webster’s Third New International Dictionary of the English Language Unabridged* (1981) (definition of “adjacent” as “relatively near and having nothing of the same kind intervening.”).

D. spaced apart from (’539 Patent, claims 1, 21, 27)

69. I have been asked to provide my opinion as to how a POSITA would understand the phrase “spaced apart from” as used in the ’539 patent, and in particular asserted claims 1, 21, and 27 of the ’539 patent. As explained below, it is my opinion that, in the context of asserted claims 1, 21, and 27 of the ’539 patent, a POSITA would understand the term “spaced apart from” to mean “not touching any inner surface of the housing.”

70. The term “spaced apart from” appears in asserted claims 1, 21, and 27 of the ’539 patent and is used in those claims in a manner which is interrelated with other elements of the claims. Thus, the context of the term “spaced apart from” within those claims is important to how a POSITA would understand the meaning of that term as it used in those claims. In order to understand the context, below I set forth claims 1, 21, and 27 and have highlighted portions of the claims that include the term “spaced apart from”:

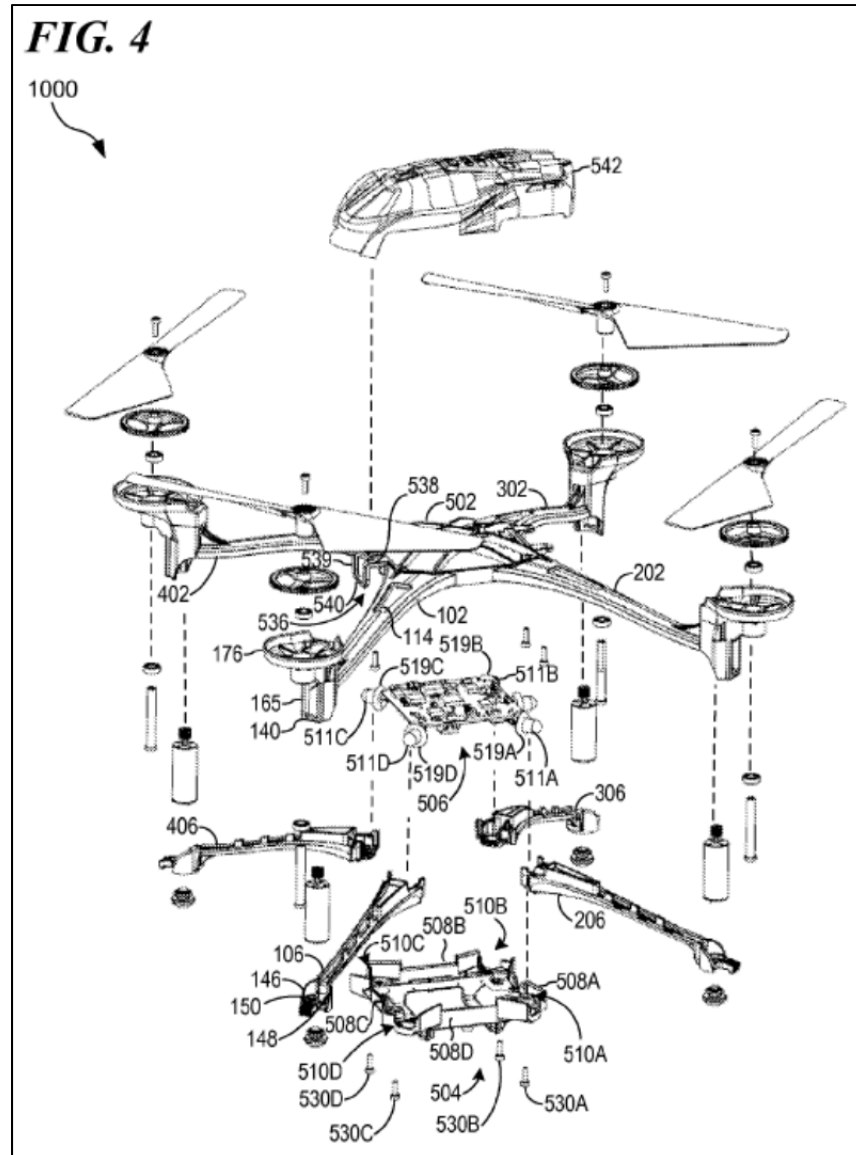
1. A radio controlled model rotorcraft having an electronics compartment, the model rotorcraft comprising:
a circuit board;
at least one light source electrically coupled to the circuit board; and
a housing, the housing comprising:
a first frame;
a second frame removably coupled to the first frame; and
one or more housing inner surfaces;
wherein the circuit board is mounted to the first frame and the second frame by the at least one light source;
wherein the circuit board is disposed within the housing spaced apart from each housing inner surface; and
at least one rotor assembly, the at least one rotor assembly comprising at least one arm extending from the housing and at least one rotorcraft component.

21. A compartment for receiving an electronic component of a radio controlled model rotorcraft, comprising:
a first frame
a circuit board;
at least one light source electrically coupled to the circuit board;
wherein the first frame receives and at least partially encloses the at least one light source;
wherein the circuit board is mounted within the first frame by the at least one light source;
wherein the circuit board is disposed within the first frame spaced apart from the inner surfaces of the first frame; and
wherein the first frame comprises at least one opening passing outwardly through a surface of the first frame, the at least one opening optically paired with, and receiving light from the at least one light source.

27. A compartment for receiving an electronic component of a radio controlled model rotorcraft, comprising:
a housing at least partially forming an enclosure;
a circuit board at least partially enclosed within the housing, the circuit board comprising a substrate portion disposed substantially within a first plane; and
at least one light source secured to and electrically coupled to the circuit board;
wherein the at least one light source is oriented to extend substantially away from the circuit board, along a direction substantially aligned with the first plane; and
wherein the circuit board is disposed within the housing and spaced apart from each inner surface of the housing.

71. As set forth above, the term “spaced apart from” is used in claims 1, 21, and 27 to clarify the manner in which the circuit board is disposed within the housing / first frame. The drawings and specification of the ’539 patent illustrate and describe the disposition of the circuit board within the housing / first frame in a manner consistent with my above opinion as to how a POSITA would understand the phrase “spaced apart from.”

72. For example, Fig. 4 of the ’539 patent shows an exploded view of the rotorcraft. Referring to Fig. 4, it should be noted that 506 denotes the printed circuit board assembly (PCBA) with attached light sources 511A-D.



73. In addition, Fig. 12 of the '539 patent shows the PCBA in place in the lower housing (base 504). With reference to Fig. 12, the specification of the '539 patent describes that “[t]he base 504 may be coupled to the first cover 502 as described above, and locator recesses 518A-E may receive the lower portion of the locators 519A-E and fix the location of each light source 511A-E within the center pod assembly 500” and “[t]he PCBA 506 may be operably coupled to both the first cover 502 and base 504 within the formed center pod assembly 500

without the PCBA 506 contacting any portion of the interior surface of the center pod assembly 500.” Col. 18:7-14.

74. In numerous real-world applications, including toy cars, cellular (smart) phones, computers, automobiles, aircraft, etc., it is not uncommon for impact loads to result in an electrical component to fail. This is often the case when, for example, a person drops an electronic toy to the ground. The failure often occurs in the electrical connection between an integrated circuit and its housing or package, or between a package and its circuit board. The design disclosed in the ’539 patent is intended to suspend the electrical circuit board within the housing and isolate the board from the inner surfaces of the housing. In the event of an impact, the force applied to the integrated circuit chips and the components mounted on the circuit board is significantly lower as a result.

75. I reviewed portions of the file history for the ’539 patent when preparing this declaration. The file history of the ’539 patent informs my opinion regarding what the inventors intended when they included this phrase in the relevant claims. For example, to distinguish over a prior art reference that the Examiner alleged to disclose “[t]he circuit board appears to be mounted directly to the housing,” the applicant amended claim 1 to recite “wherein the circuit board is disposed within the housing spaced apart from each housing inner surface,” and amended claim 27 to recite “wherein the circuit board is disposed within the housing and spaced apart from each inner surface of the housing.” ’539 FH, May 26, 2015 Notice of Allowability at 3-13; *see also* ’539 FH, September 2, 2015 Notice of Allowability at 3-13.

76. Based upon the above evidence, it is my opinion that, in the context of asserted claims 1, 21, and 27 of the ’539 patent, a POSITA would understand the term “spaced apart from” to mean “not touching” or “not in contact.” With respect to the specific limitations of

asserted claims 1, 21, and 27 in which the term “spaced apart from” is found, a POSITA would understand the term “spaced apart from” to mean “not touching any inner surface of the housing.” Such a meaning is logical in the context of the subject matter disclosed in the ’539 patent. By mounting the circuit board to the frame through the light source, the circuit board is suspended over the frame and protected against violent shocks or vibrations from the rotors.

E. mounted (’539 Patent, claims 1, 12, 21)

77. I have been asked to provide my opinion as to how a POSITA would understand the term “mounted” as used in the ’539 patent, and in particular asserted claims 1, 12, and 21 of the ’539 patent. As explained below, it is my opinion that, in the context of asserted claims 1, 12, and 21 of the ’539 patent, a POSITA would understand the term “mounted” to mean “securely affixed or fastened.”

78. The term “mounted” appears in asserted claims 1, 12, and 21 of the ’539 patent and is used in those claims in a manner which is interrelated with other elements of the claims. Thus, the context of the term “mounted” within those claims is important to how a POSITA would understand the meaning of that term as it used in those claims. In order to understand the context, below I have set forth claims 1, 12, and 21, and have highlighted portions of the claims that include the term “mounted”:

1. A radio controlled model rotorcraft having an electronics compartment, the model rotorcraft comprising:
a circuit board;
at least one light source electrically coupled to the circuit board; and
a housing, the housing comprising:
a first frame;
a second frame removably coupled to the first frame; and
one or more housing inner surfaces;
wherein the circuit board is mounted to the first frame and the second frame by the at least one light source;
wherein the circuit board is disposed within the housing spaced apart from each housing inner surface; and
at least one rotor assembly, the at least one rotor assembly comprising at least one arm extending from the housing and at least one rotorcraft component.

12. A radio controlled model rotorcraft, comprising:
a circuit board;
at least one first light source electrically coupled to the circuit board; and
a housing, comprising:
a first frame, at least a portion of the first frame comprising at least one first light securing surface;
a second frame coupled to the first frame; and
wherein the at least one first light securing surface secures at least a portion of the at least one first light source between the coupled first and second frames;
wherein the circuit board is mounted to the first frame by the at least one first light source secured by the at least one first light securing surface; and
at least one rotor assembly comprising an arm, the arm further comprising at least one light transmitting channel extending from the housing, the at least one light transmitting channel configured to allow light from the at least one first light source to be emitted beyond the housing and into the at least one light transmitting channel.

21. A compartment for receiving an electronic component of a radio controlled model rotorcraft, comprising:
a first frame
a circuit board;
at least one light source electrically coupled to the circuit board;
wherein the first frame receives and at least partially encloses the at least one light source;
wherein the circuit board is mounted within the first frame by the at least one light source;
wherein the circuit board is disposed within the first frame spaced apart from the inner surfaces of the first frame;
and
wherein the first frame comprises at least one opening passing outwardly through a surface of the first frame, the at least one opening optically paired with, and receiving light from the at least one light source.

79. In the above claims, the term “mounted” is used in a manner consistent with its ordinary meaning, which is “securely affixed or fastened.” *See* The American Heritage College Dictionary (3rd Ed. 1993) (definition of “mount” as “To fix securely to a support.”). The term “mounted” is also widely used in engineering practice. Mounting bolts, surface mounts, snap mounts, etc., all refer to methods of securely fastening objects.

80. The specification of the '539 patent repeatedly uses the term “mounted” to describe structures that must be securely affixed or fastened together, else they would fall apart by operation of gravity or vibration; or they would not function properly. This is particularly true in the context of a patent concerning a rotorcraft.

81. For example, the specification of the '539 patent discloses:

In an embodiment, the torque transfer assembly 180 may further comprise a first gear 182 mounted co-axially with the propeller shaft 107 in the propeller shaft cradle 170. The first gear 182 may be configured to mechanically mesh with the motor gear 115 to transfer torque from the motor shaft 109 to the propeller shaft 107 and to support powered flight of the rotorcraft 1000.

Col. 14:23-29.

82. The specification of the '539 patent also describes “[t]he propeller shaft 107 and first propeller 104 may be mounted in the propeller shaft cradle and supported for rotation by a first bearing 117A and a second bearing 117B” and “[t]he first gear 182 may be mounted on the shaft 107 between the second bearing 117B and the first propeller 104.” Col. 14:32-34; 14:62-63.

83. The file history of the '539 patent informs my opinion regarding what the inventors intended when they included the term “mounted” in the relevant claims. For example, the Examiner alleged that a particular prior art reference “teaches a UAV having a circuit board within a housing.” '539 FH, May 26, 2015 Notice of Allowability at 13. To distinguish over this prior art reference, the applicant amended the claim 1 recitation “wherein the circuit board position is at least *partially fixed* when the one or more locator members are received by the upper receptacles of the first cover” to “wherein the circuit board is *mounted* to the first frame and the second frame by the at least one light source.” *Id.* at 3 (emphasis added); *see also id.* at 4 (amending the claim 2 recitation “wherein the circuit board is *positioned within* the first cover and spaced apart from the first cover” to “wherein the circuit board is *mounted* to the first frame and the second frame by the at least one light source received within the at least first recess.”) (emphasis added); *id.* at 6 (amending the claim 11 recitation “wherein one or more of the rigid couplings of the one or more light sources coupled to the circuit board is configured to at least *partially support* the circuit board” to “wherein the circuit board is *mounted* within the housing solely by a plurality of the light sources.”) (emphasis added); *id.* at 7 (amending the claim 12 recitation “wherein at least one of the rigid couplings of the one or more light sources is configured to at least *partially support* the circuit board, with the circuit board spaced apart from the center housing” to “wherein the circuit board is *mounted* to the first frame by the at least one first light source secured by the at least one first light securing surface”) (emphasis added); *id.* at

9 (amending the claim 21 recitation “wherein the circuit board is at least *partially supported within* the housing by the at least one light emitting diode coupled to the circuit board by a rigid coupling” to “wherein the circuit board is *mounted* within the first frame by the at least one light source”) (emphasis added).

84. Based upon the above evidence, it is my opinion that, in the context of asserted claims 1, 12, and 21 of the '539 patent, a POSITA would understand the term “mounted” to mean “securely affixed or fastened.”

F. movable ('541 Patent, claim 1)

85. The term “movable” appears in asserted claim 1 of the '541 patent. The context of the term “movable” within this claim is important to how a POSITA would understand the meaning of that term as used in the claim. In order to understand the context, below I have set forth a portion of claim 1 of the '541 patent and have highlighted the portion of the claim that includes the term “movable”:

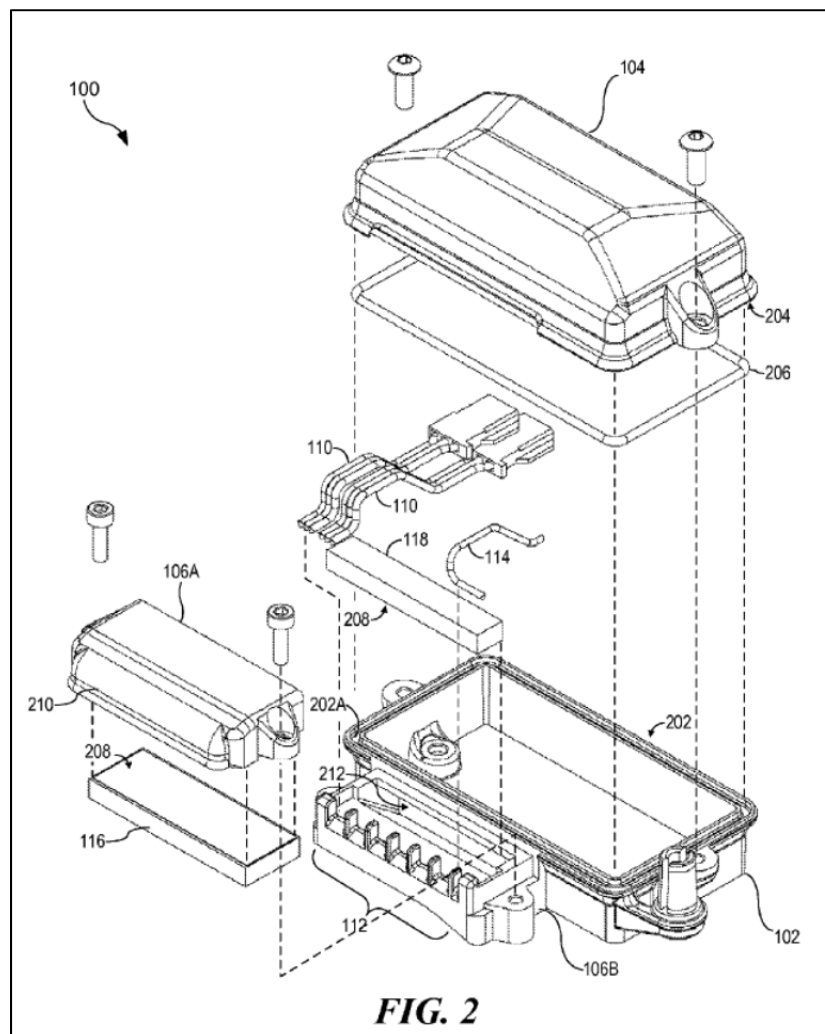
1. A protective enclosure for a model vehicle component, comprising:
 - an enclosure comprising a first enclosure member and a second enclosure member, wherein the first and second enclosure members are coupleable together to form the enclosure;
 - at least one conveyance extending from inside the enclosure to outside the enclosure, wherein the at least one conveyance comprises one or more wires separated from immediate surroundings and preventing passage of contaminants past or between the one or more wires by electrical insulation material encasing the one or more wires;
 - a clamp comprising:
 - a first clamp surface and a second clamp surface;
 - wherein at least a portion of each of the first clamp surface and the second clamp surface is configured to be positioned in a clamped position forming a clamp mouth around at least a portion of the at least one conveyance extending from inside to outside the enclosure, the clamp mouth restricting the passage of contaminants; and
 - wherein the first clamp surface is movable from the clamped position forming the clamp mouth to an unclamped position relatively farther from the second clamp surface releasing the at least one conveyance from the clamp mouth, when the first enclosure member is uncoupled from the second enclosure member;

86. As set forth above, the term “movable” is used in claim 1 to clarify that the “first clamp surface” *can be* moved “from the clamped position forming the clamp mouth to an unclamped position . . . when the first enclosure member is uncoupled from the second enclosure member.” In other words, when the first and second enclosure members are uncoupled, then the first clamp surface can be moved—separately from the uncoupled enclosure members—from the clamped position to the unclamped position.

87. Although the specification of the ’541 patent discloses a “clamp 106” that “comprises a top portion 106a and a bottom portion 106b,” the specification does not include any mention of a “clamped position,” “unclamped position,” or “first clamp surface,” and does not disclose anything about a surface of clamp 106 being “movable” from a clamped position to an

unclamped position “when the first enclosure member is uncoupled from the second enclosure member.” Col. 2:34-36.

88. However, the drawings of the '541 patent illustrate that what may be presumed to correspond to the “first clamp surface” is “movable” in a manner consistent with my above opinion as to how a POSITA would understand the term. For example, Fig. 2 of the '541 patent clearly shows the clamp 106 (consisting of top clamp portion 106a and bottom clamp portion 106b) as being separate from the enclosure members (base 102 and cover 104).



89. Fig. 2 of the '541 patent, which illustrates an exploded assembly view of the enclosure 100, clearly shows that the base 102 and cover 104 are coupled together by a first pair

of screws, and the top clamp portion 106*a* and bottom clamp portion 106*b* are coupled together by a second, different pair of screws. As such, when the base 102 and cover 104 (first and second enclosure members) are uncoupled, the clamping surfaces of the top clamp portion 106*a* and bottom clamp portion 106*b* can remain in a clamped position forming the clamp mouth 108. If the pair of screws joining together the top clamp portion 106*a* and the bottom clamp portion 106*b* are removed, then the clamping surface of the top clamp portion 106*a* (the first clamp surface) can be moved—separately from the uncoupled enclosure members—from the clamped position to an unclamped position.

90. It is thus my opinion that, in the context of asserted claim 1 of the '541 patent, a POSITA would understand “the first clamp surface is movable . . . when the first enclosure member is uncoupled from the second enclosure member” to mean the “first clamp surface can move independently of the uncoupled enclosure members.”

G. electrically coupled ('539 Patent, claim 27)

91. I have been asked to provide my opinion regarding the proper interpretation of the term “electronically coupled” as it appears in claim 27 of the '539 patent. As explained below, it is my opinion that, in the context of claim 27 of the '539 patent, a POSITA would understand the term “electronically coupled” to mean “rigid metal conductor electrically connecting the circuit board to the light source.”

92. The term “electrically coupled” appears in claim 27 of the '539 patent. The context of the term “electrically coupled” within this claim and the specification of the '539 patent is important to how a POSITA would understand the meaning of the term as used in the claim. In order to understand the context, below I have set forth claim 27 of the '539 patent and have highlighted the portion of the claim that includes the term “electrically coupled”:

27. A compartment for receiving an electronic component of a radio controlled model rotorcraft, comprising:
a housing at least partially forming an enclosure;
a circuit board at least partially enclosed within the housing, the circuit board comprising a substrate portion disposed substantially within a first plane; and
at least one light source secured to and electrically coupled to the circuit board;
wherein the at least one light source is oriented to extend substantially away from the circuit board, along a direction substantially aligned with the first plane; and
wherein the circuit board is disposed within the housing and spaced apart from each inner surface of the housing.

93. If a device is electrically coupled to a circuit board, it means there is a physical connection between the device and the circuit board, and this connection is through a material with low electrical resistance. This is usually done with a metal, but some electrically conductive polymers and adhesives exist can also provide this feature. It is natural that a light be electrically coupled to a circuit board. The circuit board provides a mounting and connectivity of the hardware that forms the control and power electronics.

94. The drawings and specification of the '539 patent illustrate and describe the claimed electronic coupling consistent with my opinion on how this phrase should be interpreted. The specification of the '539 patent describes the coupling of the light source to the circuit board as "compris[ing] substantially rigid metal conductors, and may be soldered to the circuit board of the PCBA to create a substantially rigid connection between the light source 511A-E and the circuit board." Col. 17:59-62. In particular, Fig. 12 illustrates the electronic coupling (526A-E) of the light source to the circuit board and shows a rigid metal connection.

H. one or more wires separated from immediate surroundings and preventing passage of contaminants past or between the one or more wires ('040 Patent, claim 20; '541 Patent, claim 1)

95. I have been asked to provide my opinion regarding the proper interpretation of the phrase "one or more wires separated from immediate surroundings and preventing passage of

contaminants past or between the one or more wires” as it appears in claim 20 of the ’040 patent and claim 1 of the ’541 patent. As explained below, it is my opinion that, in the context of claim 20 of the ’040 patent and claim 1 of the ’541 patent, a POSITA would understand the phrase “one or more wires separated from immediate surroundings and preventing passage of contaminants past or between the one or more wires” to mean “one or more separate and distinct wires, not including a bundle of wires, and preventing passage of contaminants between the one or more separate and distinct wires.”

96. The context of the phrase “one or more wires separated from immediate surroundings and preventing passage of contaminants past or between the one or more wires” within claim 20 of the ’040 patent and claim 1 of the ’541 patent is important to understand the meaning of that phrase as used in the claims. In order to understand the context, below I set forth a portion of claim 20 of the ’040 patent and highlight the portions of the claim that include the phrase:

at least one conveyance aperture extending through a wall of the enclosure member, the conveyance aperture configured to allow at least one conveyance to pass from the inside of the enclosed space through the conveyance aperture to the outside of the enclosed space, wherein the at least one conveyance comprises one or more wires separated from immediate surroundings and preventing passage of contaminants past or between the one or more wires by electrical insulation material encasing the one or more wires;

’040 patent, claim 20.

97. Moreover, the prosecution history of the ’040 patent informs my opinion regarding what the inventors intended when they included this phrase in the relevant claims. In order to overcome a fourth rejection of the pending claims of Application No. 11/872,872, the patent application leading to the ’040 patent, based upon cited prior art, the applicant proposed

an amendment to the claims to “recite a seal with flexible surfaces that conforms around at least a portion of opposite sides of *a single wire*, in combination with the other limitations of each respective claim, would patently distinguish from the art currently of record.” ’040 FH, May 28, 2012 Response at 10 (emphasis in original). To further distinguish the amended claims from the cited art U.S. Patent No. 6,602,089 (“Abe”), the applicant went on to state that Abe teaches the “tubing 4d surrounds a bundle of wires . . . [b]ut the tubing 4d surrounding the loose wires does not meet the claimed conveyance seal limitation. The tubing 4d does not conform around opposite sides of any single wire, as discussed with the Examiner in the Interview.” *Id.* at 13. By so arguing, a POSITA would understand that the applicant explicitly disavowed a bundle of wires from the claim scope.

98. One of ordinary skill would understand this phrase to mean “one or more separate and distinct wires, not including a bundle of wires, and preventing passage of contaminants between the one or more separate and distinct wires.” The main reason the applicant included this phrase is to teach how the invention would prevent contaminants, especially water, from penetrating into the housing where the electrical components are located, in order to prevent short circuits, corrosion, or other damage to these components. The defendants’ proposed construction satisfies that goal.

I. resiliently deformable material (’763 Patent, claim 4)

99. I have been asked to provide my opinion regarding the proper interpretation of the phrase “resiliently deformable material” as that phrase appears in claim 4 of the ’763 patent. As explained below, it is my opinion that, in the context of claim 4 of the ’763 patent, a POSITA would understand the phrase “resiliently deformable material” to mean “flexible material capable of changing shape and returning to the original shape.”

100. The context of the phrase “resiliently deformable” within claim 4 of the ’763 patent is important to understand the meaning of that phrase as used in that claim. In order to understand the context, below I set forth claim 4 of the ’763 patent and have highlighted the portions of the claim that include the term “resiliently deformable material”:

4. The radio controlled model rotorcraft of claim 1, further comprising:
the at least one rotor assembly further comprising:
one or more foot members, each composed of a resiliently deformable material; and
wherein at least one of the one or more foot members is disposed beneath the at least one motor, providing landing support and impact resistance to the at least one rotor assembly.

101. The term “resiliently deformable material” means a “flexible material capable of changing shape and returning to the original shape”. Resilience is a term from solid mechanics referring to the ability of a material to store energy through elastic (recoverable) deformation. Classically, spring materials are resilient. The reference to providing “landing support and impact resistance” implies that the material is intended to protect the vehicle.

102. When an aerial drone lands, it is in motion, but must be brought to rest. Just before contacting a surface (such as the ground), it has kinetic energy, that is, it is moving. This energy must be absorbed or dissipated during landing, since it has no kinetic energy once it is at rest. This energy can be absorbed by plastically (permanently) deforming the toy components, or deforming the earth, or elastically storing the energy and subsequently releasing the energy in the form of heat dissipation. The resilient materials imply a material that has a high capacity to absorb energy and remain elastic.

103. Further, the specification of the ’763 patent talks about the foot member being a shock absorber and being comprised of an elastic material, such as rubber, foam and the like. *See* ’763 patent, col. 12:47-49; 12:52-54. This disclosure further supports my opinion.

J. relatively farther ('541 Patent, claim 1; '040 Patent, claim 20)

104. I have been asked to provide my opinion regarding the indefinite nature of the phrase “relatively farther” as that phrase appears in claim 1 of the '541 patent and claim 20 of the '040 patent. As explained below, it is my opinion that, in the context of claim 1 of the '541 patent and claim 20 of the '040 patent, the phrase “relatively farther” is indefinite—meaning a person of ordinary skill in the art would not understand the scope of the claim with reasonable certainty. In order to understand the context, below I set forth claim 1 of the '541 patent and claim 20 of the '040 patent, and have highlighted the portions of the claims that include the term “relatively farther”:

wherein the first clamp surface is movable from the clamped position forming the clamp mouth to an unclamped position relatively farther from the second clamp surface releasing the at least one conveyance from the clamp mouth, when the first enclosure member is uncoupled from the second enclosure member; and

'541 patent, claim 1.

wherein the first clamp surface is movable from the clamped position forming the clamp mouth to an unclamped position relatively farther from the second clamp surface releasing the at least one conveyance from the clamp mouth;

'040 patent, claim 20.

105. In this use, the term “relatively farther” is vague, in that there the patent does not explain a reference for the term “relative”. That is, “relatively” implies a relation between at least two objects: “Jim is tall relative to Joe. The Porsche is expensive relative to the Ford. State income taxes are high relative to Texas.” Without a reference, the language is less exact: “Jim is relatively tall. The Porsche is relatively expensive. The state income taxes are relatively high.” This does not give any indication of value – Jim and Joe could both be short; the Porsche could

be just as expensive as other cars with the same features; the comparison of taxes may be with Indiana, with a 1% state income tax (both are relatively low compared to Illinois, for example).”

106. In this context, what is described is a clamp mouth that not only opens, but also is movable to a new location relative to any object on the toy. One of skill in the art, however, would not know the bounds of the scope of what that object could be.

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on June 1, 2017 at Arlington, Virginia.

A handwritten signature in black ink, appearing to read 'SRS' followed by a stylized flourish.

Steven R. Schmid, Ph.D., P.E., FASME

88649941